Sheet 1, 2 Sheets.

W. B. Bement.

Turning Lathe.

No. 64,938. Patented May 21, 1867.

Fig: 2.

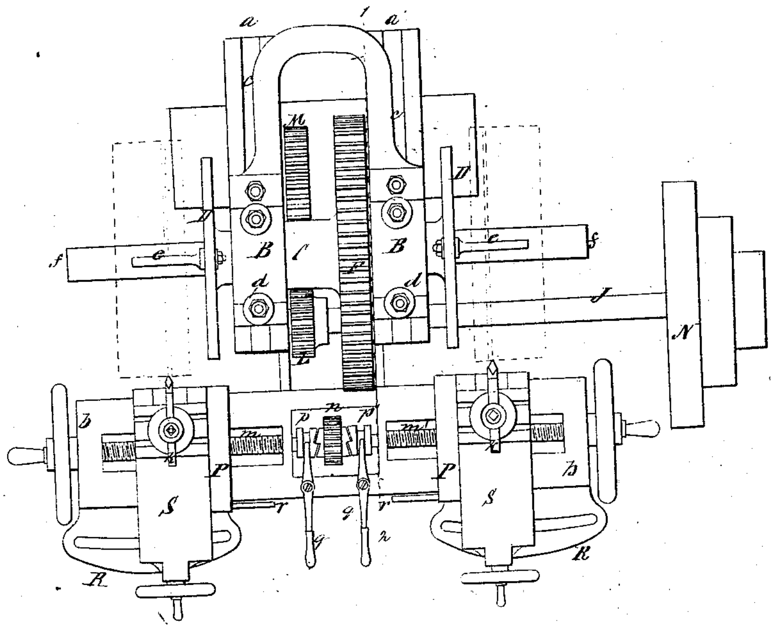
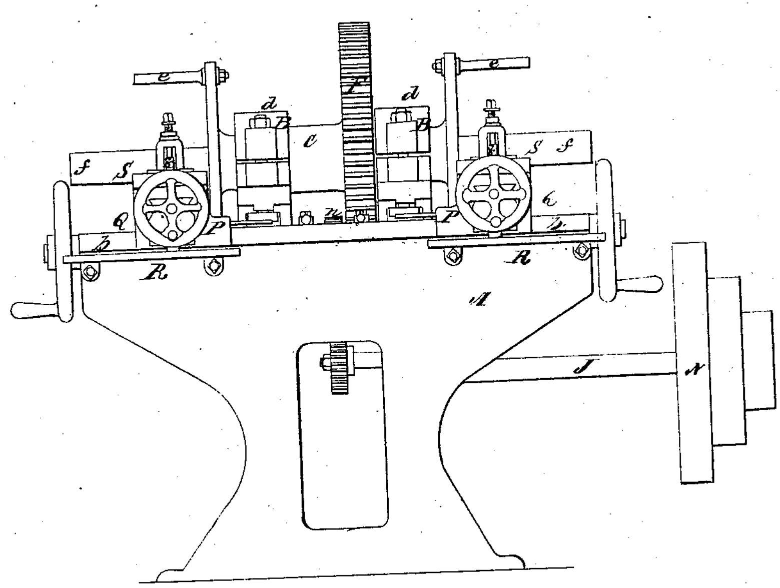


Fig: 1.



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Wm B. Bement
By his Atty
[illegible]

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

Sheet 2, 2 Sheets.

W. B. Bement.

Turning Lathe.

No. 64,938. Patented May 21, 1867.

Fig: 3.

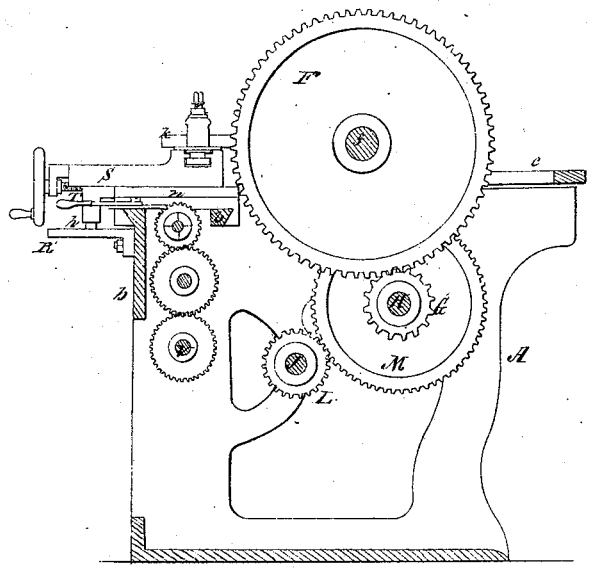
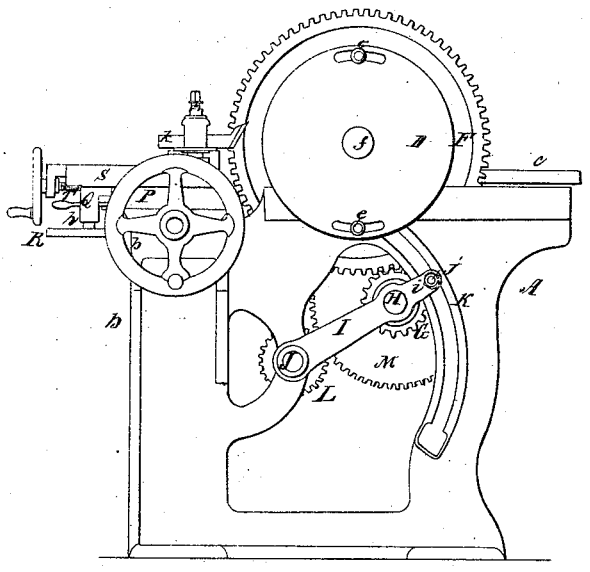


Fig: 4.



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United States Patent Office.

WILLIAM B. BEMENT, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 64,938, *dated May* 21, 1867.

IMPROVEMENT IN LATHES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM B. BEMENT, of Philadelphia, Pennsylvania, have invented an improved Lathe for Turning Pulleys; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists of mechanism, fully described hereafter, by the aid of which the peripheries of pulleys can be turned to the desired shape with great rapidity and without the necessity of resorting to the tedious adjustment and careful attention which are demanded from skilled workmen in turning pulleys by the ordinary lathes.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation. On reference to the accompanying drawing, which forms a part of this specification—

Figure 1 (drawing No. 1) is a front view of my improved lathe for turning pulleys.

Figure 2, a plain view.

Figure 3, (drawing No. 2,) a transverse vertical section on the line 1–2, fig. 1.

Figure 4, a side view.

Similar letters refer to similar parts throughout the several views.

A is the frame of the machine on which are formed the two parallel beds *a* and *a'*, and at right angles to the latter a third bed, *b*. Each of the beds *a* and *a'* has a longitudinal groove, *c*, narrower above than below, the wider portion for receiving the heads of the bolts *d* and the narrower portion for the reception of a projection on the under side of a box, B, one box being secured to each bed by the aforesaid bolts. The boxes B B are adapted to the journals of the hollow spindle C, on each end of which is a face-plate, D, having two or more carriers *e e*, and on the spindle is fitted a detachable mandrel, *f*, or there may be two mandrels *f*, one fitted into each end of the spindle C. The two boxes B B are connected together by the strip *t*, so that both may be adjusted accurately and simultaneously on the beds *a* and *a'*. On the spindle C, and forming part of the same, is a cog-wheel, F, into which gears a pinion, G, on the shaft H, which is carried by and is arranged to turn in two arms I I hung loosely to hubs or projections *w* on the frame in which the shaft J turns, the latter being concentric with the projections. Each arm I has a projection, *i*, bearing against a segment, *k*, cast permanently on the frame, the centre of the shaft J being the centre of the segment. Each segment has a groove for receiving the T-head of a bolt, *j*, by means of which the arms L are secured after adjustment. On the shaft J is a pinion, L, gearing into a cog-wheel, M, which is secured to the shaft J, and on the same shaft J is a cone-pulley, N, for receiving a belt, passing around a similar pulley on the counter or driving-shaft above. The opposite edges of the bed *b* are bevelled for the reception of the two saddle-plates P P, each of which has a recess with bevelled edges for the reception of a cross-slide, Q, and each of the latter has a projection, *h*, to which is attached a guide-pin or an anti-friction roller, which fits snugly, but so as to move freely in a curved or angular slot in a plate R, the plates being secured to the front of the frame, as shown in figs. 1 and 2. A third slide, S', is arranged to move to and fro on each slide Q, and is controlled by a screw-spindle, T, after the manner of an ordinary slide-rest, each upper slide *s* carrying a tool, *k*, which is adjustable, and is secured in the usual manner. Of the two slide-rests, thus constructed, one is under the control of the screw-shafts *m*, and the other of the screw-shaft *m'*, both shafts turning in the bed *b*. On the ends of the two screw-shafts, where they meet or nearly meet each other, turns a pinion, *n*, which has no lateral movement, but on one side of which are projecting teeth adapted to those of the clutch *p* of the screw-shafts *m*, and on the other side similar teeth adapted to a similar clutch on the screw-shaft *m'*, the clutches being arranged to slide freely on, but not to turn independently of their respective shafts, and being controlled by handles *q*, as seen in fig. 2. The pinion *n* receives its motion from a shaft, V, through the train of wheels, (illustrated in fig. 3,) the wheels being so constructed that a change of feed can be readily made. Motion may be communicated to this train of feed-wheels by securing a worm or tangent-wheel to the shaft V, driven by a worm on a shaft at right angles to the said shaft V, and receiving its motion through the medium of mitre-wheels from the shaft J, or the shaft V may be driven by a belt.

In using the machine, two pulleys are operated on at the same time, one pulley being fitted to one overhanging mandrel, and the other to the other mandrel. The two slide-rests, with their tools, are then adjusted to their proper

positions for commencing the cuts, the clutches p and p' are moved into gear with the pinion n, and the driving-shaft J is set in motion, when the operation of turning the peripheries of the pulleys is commenced, and is continued automatically by the machine. Many pulleys are rounded transversely, or have faces bevelled from the centre towards both edges. The desired shape is imparted to the faces of the pulleys in my machine by a slot in each of the plates R. Each slide Q is controlled by this curved slot as regards the movement of the said slide from and towards the spindle C. It will be evident that as the slide-rests traverse the bed b of the frame the cutting tool will not take a direct course in a straight line, but will traverse a course determined by that of the slots in the plate R; hence the desired rounded or angular surface may be imparted to the peripheries of the pulleys.

One of the main advantages of the machine is the facility with which the pulleys can be placed on the mandrels before being turned, and removed after completion, the arrangement of the two projecting and overhanging mandrels affording the greatest facilities for the speedy adjustment and removal of the pulleys, and this without stopping the machine, for one of the pulleys may be removed while the other is being turned. As two pulleys can be turned at one time the machine has double the capacity of an ordinary lathe, while the facilities afforded by the latter for adjusting or chucking the pulleys demand that tedious manipulation, the necessity for which my invention was designed to obviate.

The machine can be readily arranged to suit pulleys of different diameters, all that is necessary being the loosening of the bolts d which secure the boxes B B to the beds a and a' of the frame, and also loosening the bolts which secure the arms I I to the segments k k, after which the boxes B B, with the spindle C and its mandrels, can be moved from or towards the slide-rests at pleasure, and secured after adjustment; the arms I I being also so adjusted that the pinion G may be properly in gear with the wheel M. It will be seen, on reference to fig. 2, that each slide-rest is provided with a projection, r, which, coming in contact with the handle q, throws its clutch out of gear and arrests the further traverse of the adjacent slide-rest. The projections r may be made adjustable so as to arrest the traverse of the slide-rest at different points. One spindle C, with its wheel, can be readily removed to make way for another spindle, having a wheel of larger or smaller diameter, according to the power demanded by the size of the pulleys to be turned.

Although I prefer to construct the machine substantially in the manner described, it will be evident to those familiar with the manufacture of tools that many modifications may be made in the machine without departing from the main features of the invention. Without confining myself, therefore, to the precise construction or arrangement of parts herein described, I claim as my invention, and desire to secure by Letters Patent—

1. The combination of the spindle C, its two overhanging ends, driving-wheel or pulley F, and bearings B B; the whole being arranged substantially as and for the purpose herein set forth.

2. The combination of the said spindle and its two overhanging ends with the bed b carrying two slide-rests, when the said spindle can be adjusted from and towards and in a direction at right angles to the said bed b.

3. The said spindle C, its adjustable bearings B B, and its cog-wheel F, in combination with the adjustable arms I I, and the gearing herein described, or its equivalent.

4. The combination of the two slide-rests, the two screw-shafts m and m' for operating the said rests, the driving-pinion n, and the two clutches p and p'.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. B. BEMENT.

Witnesses:

JOHN M. SHINGLEY,

WILLIAM H. CROMWELL.